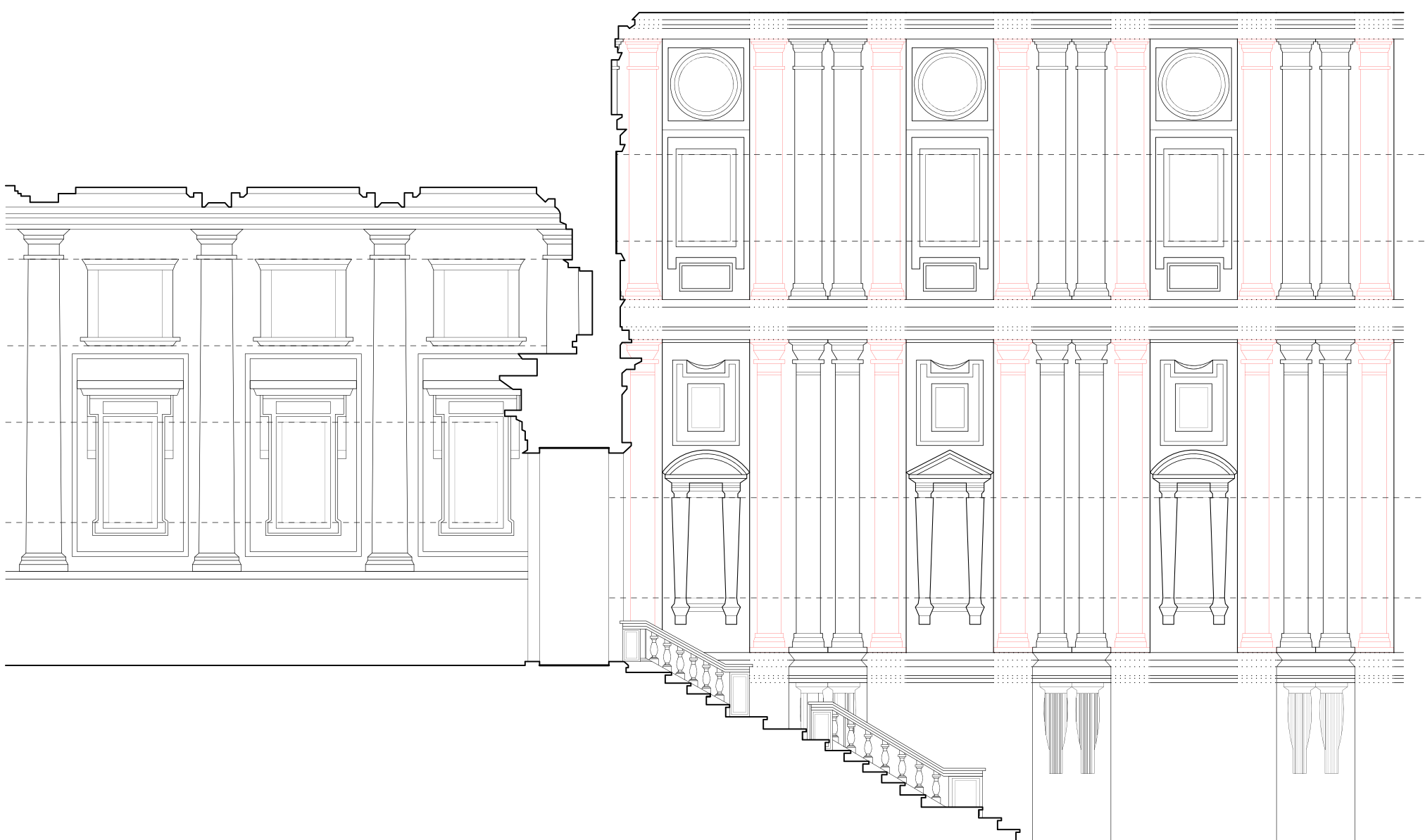


Formal Analysis I

Yale School of Architecture
Fall 2021



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01 Filippo Brunelleschi

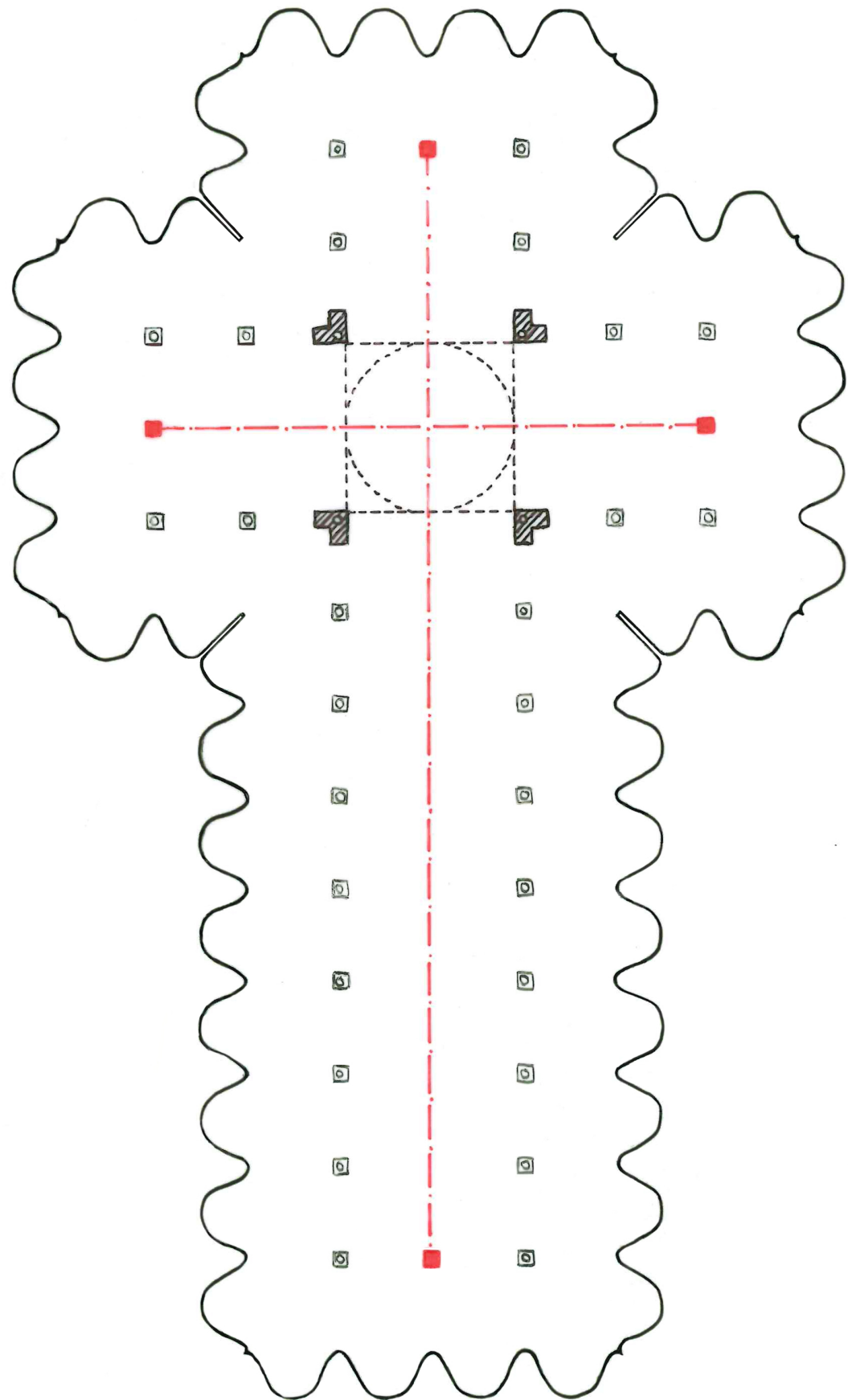
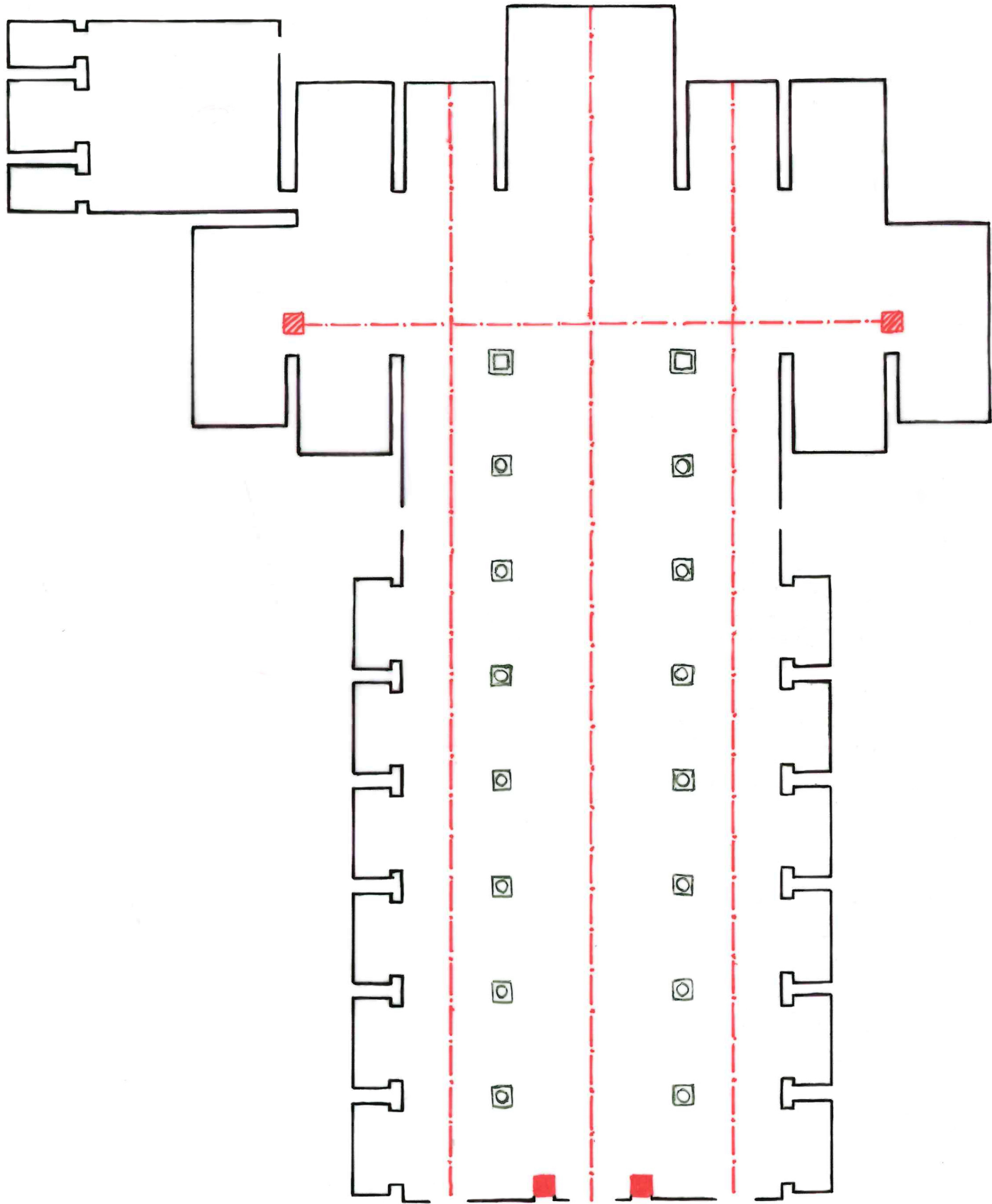
San Lorenzo | Santo Spirito Florence, Italy

Point of Interest: Linear vs. Axial Interior Composition

This critical difference analysis looks at the different spatial experiences created by the perspectival lines of sight/progression exhibited in the Church of San Lorenzo in contrast to the axial lines of sight/progression exhibited in the Santo Spirito Basilica and how these experiences are reinforced through the composition of columns and the underlying geometric units that are embedded in their layouts.

The Church of San Lorenzo contains a primary linear axis through the center of the nave with two secondary linear axes through the isles on either side. This organization leads to a continuous and linear progression which allows for the compression and expansion of the layout and boundary elements/ Wspaces to be fully experienced from the entrances to the transept. The columns positioned along the nave further emphasize these linear lines of sight by creating distinct spaces that align with the entrances.

The San Spirito Basilica exhibits two axial lines of sight, one through the nave and the other through the transept, creating distinct perimetral spaces within the layout. This organization leads to an open and airy progression with a central focus at the crossing of the transept. The columns are arranged off-center from the entrances and positioned in a way which mimic the perimeter of the space, further reinforcing the overall axial alignment.



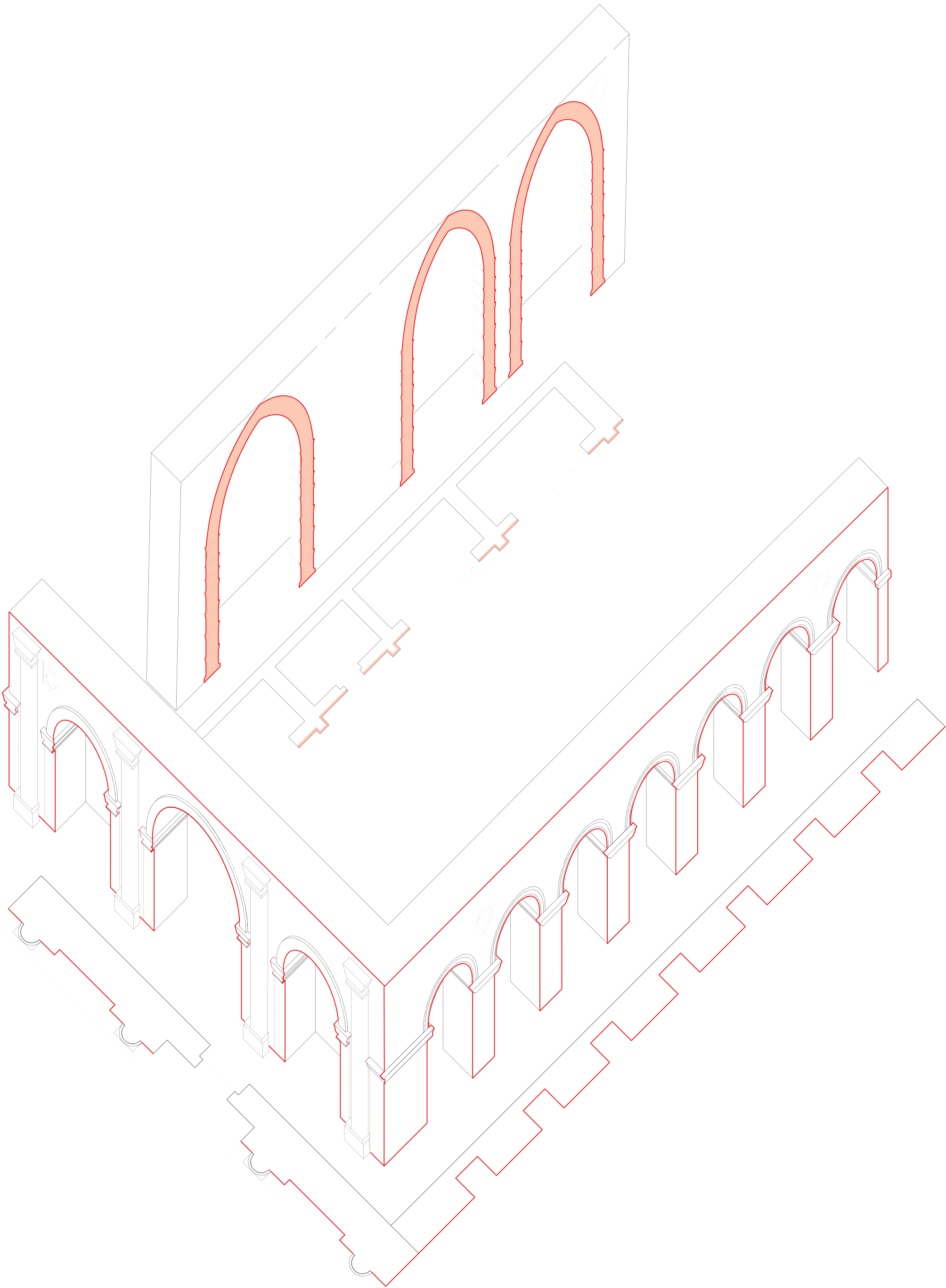
02 Leon Battista Alberti

Tempio Malatestiano

Rimini, Italy

Point of Interest: Contrasting Use of Pillar and Arch Forms

This critical difference analysis looks at Alberti's cohesive use of the pillar and triumphal arch in the front and side façades in contrast to the discrete uses along the interior façades in Tempio Malatestiano. In the front façade, the pillar form is only detailed halfway; on one side blending into the wall and on the other side creating a continuous line encompassing the impost block and arch above it. This can be seen at the three instances where the pillar and arch forms are placed. This incomplete detailing is also seen at the edges where the front meets the side façades and is continued to compose the wall. This pillar and arch form is used to reinforce the cohesion and unity of the wall and the way it encompasses and envelops the temple. In the interior façades, the pillar and triumphal arch form are fully detailed creating a stark distinction between the pillar and arch and the wall it is a part of. As a result, the pillar and arch are seen as discrete units along the wall creating an interrupted rhythm along the interior of the temple.



03 Donato Bramante & Luciano Laurana

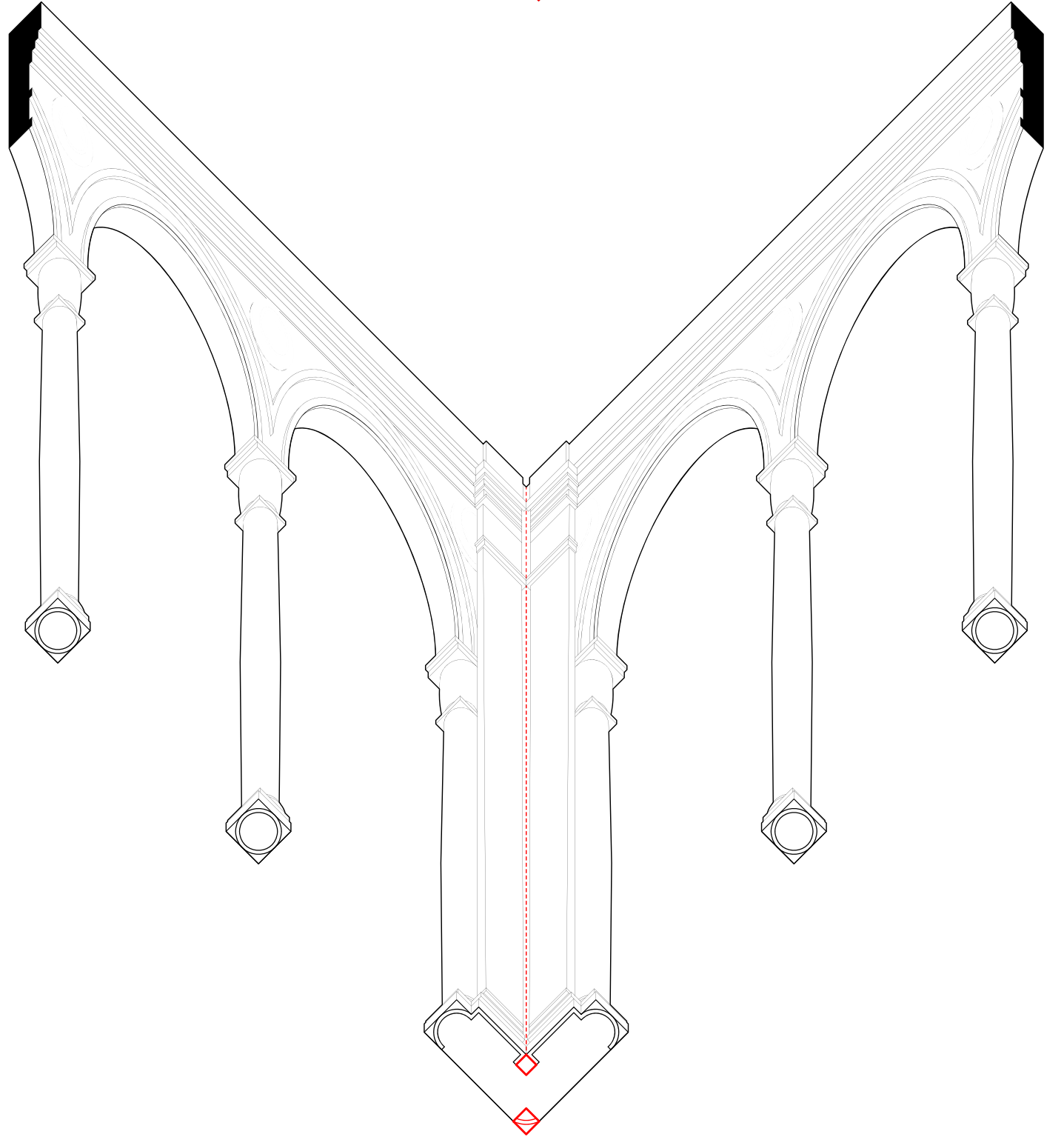
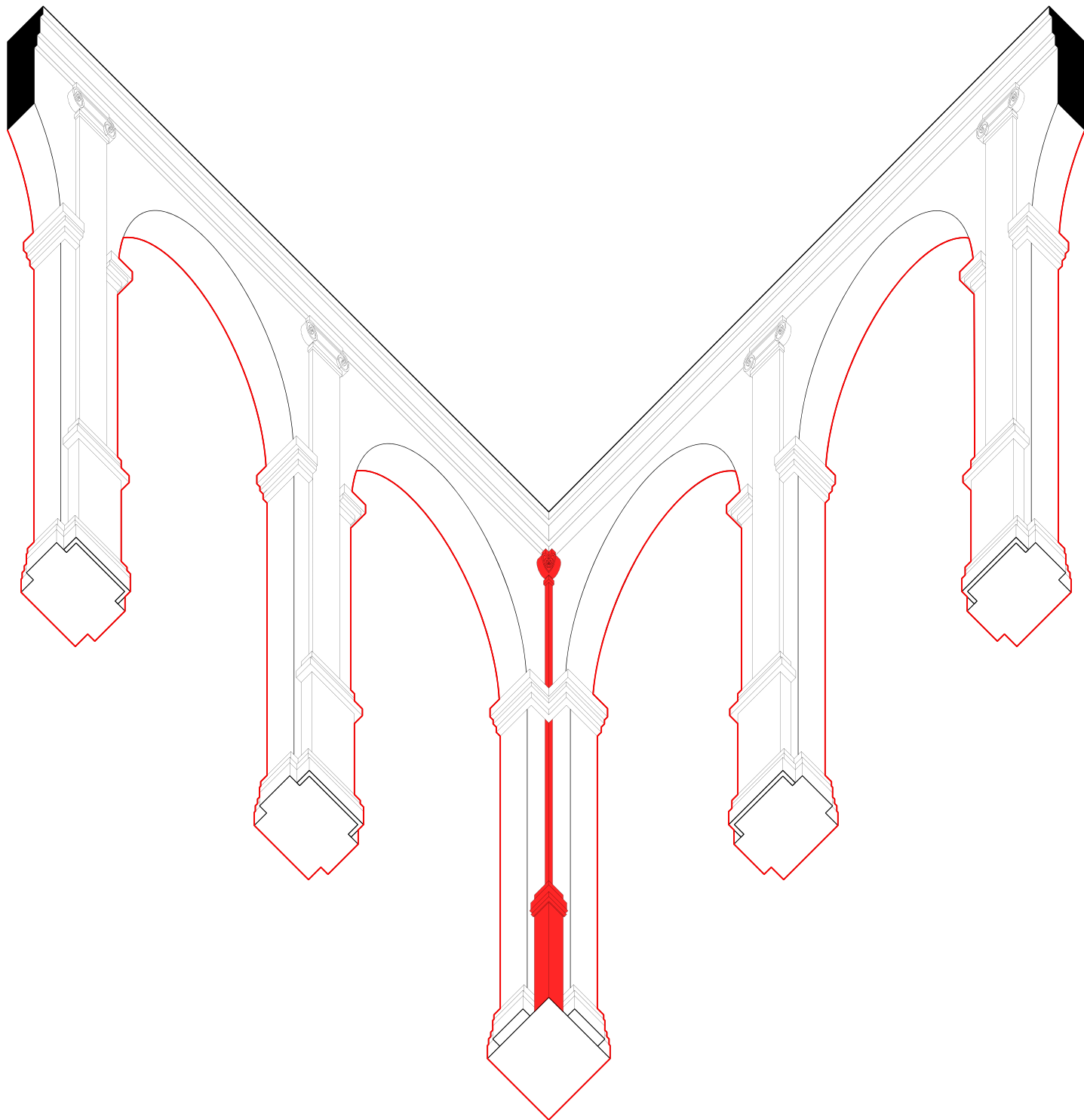
Santa Maria Dela Pace | Palazzo Ducale

Rome, Italy | Urbino, Italy

Point of Interest: Singular vs. Individual Surface Development

This critical difference analysis looks at the resulting surface conditions of the enclosing walls of Bramante’s Santa Maria Dela Pace cortile and Laurana’s Palazzo Ducale cortile as a result of the different corner conditions. In Santa Maria Dela Pace, Bramante’s treatment by merging two piers creates an erasure of the corner and a continuity between the two surfaces coming together which results in a homogenous/singular wall unit. In the interior, the corner is deemphasized and in the exterior the corner becomes accentuated in a way which follows the homogenous and seamless organization of the columns. As a result, the corner condition is no longer in focus and a clear separation between the surrounding walls and the court occurs allowing the open space to be in focus.

In Laurana’s Palazzo Ducale, the treatment of the corner is performed through a composition of engaged half circular columns and two pilasters which met at the capital. The result is a gap in between the two pilasters that accentuates the corner and alludes to an interaction between two separate surfaces at the corner. This results in a disruption between the surfaces that enclose the open space. In both the interior and the exterior, the corner is clearly defined and places emphasis on the distinct wall units of the cortile instead of the open space of the court.



04 Raffaello Sanzio da Urbino

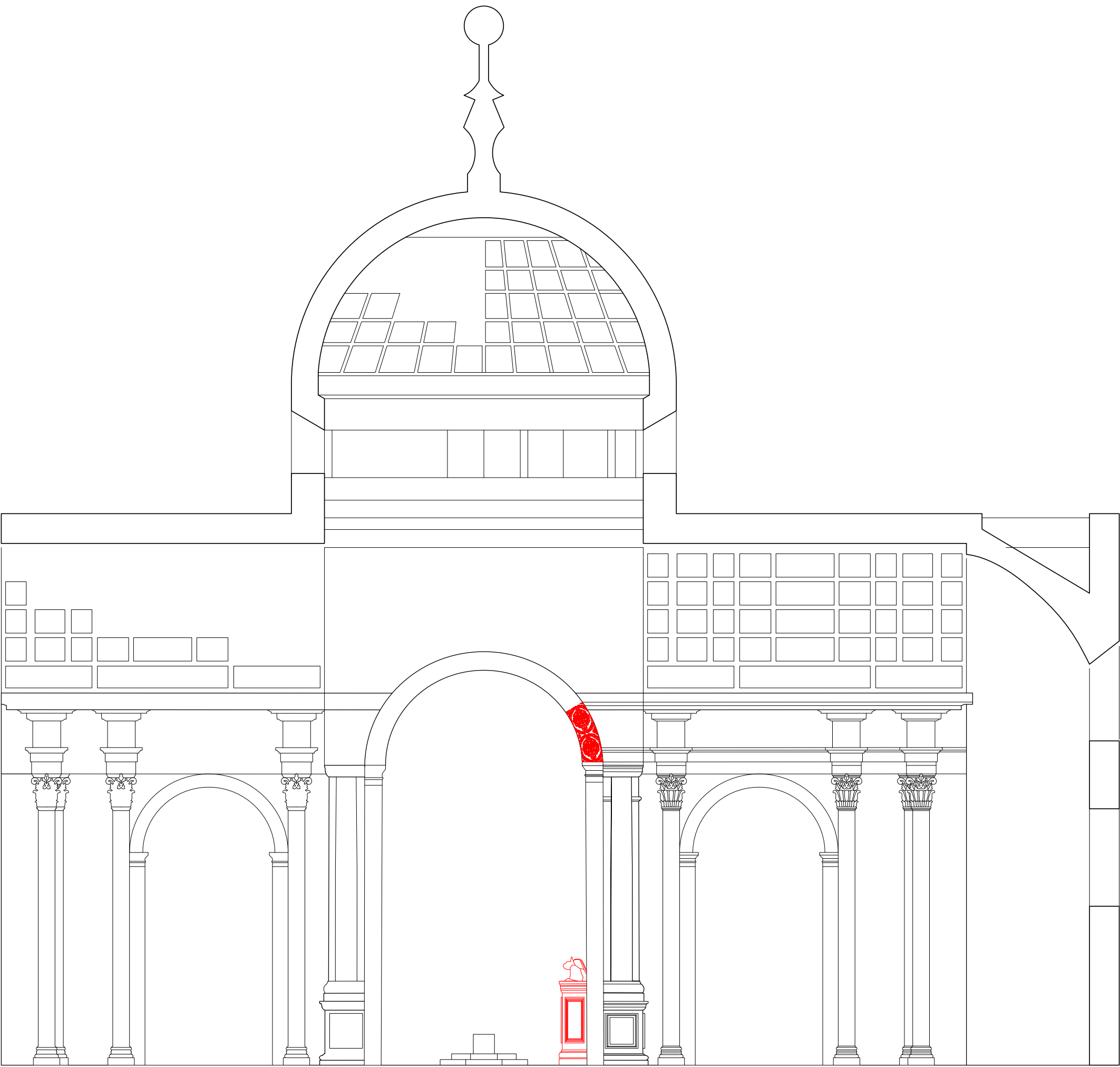
The Expulsion of Heliodorus from the Temple

Apostolic Palace, Vatican City

Point of Interest: Architectural Frameworks and Composition

This critical difference analysis at Raphael's use of an architectural framework to strengthen composition and perspectives in *The Expulsion of Heliodorus from the Temple* in contrast to his use in *The School of Athens* as both paintings showcase similar stage-like constructions of space. The composition is divided into two halves, reading from the left/right and then the center, which is seen through the position of several figures in action along linear axes at the extremities and a singular figure along a linear axis along the center. This is echoed by the division and erosion of the architectural framework which consists of a central nave with isles on either side. The focal points of the image are placed on the sides with figures flowing from the isles and not the middle where a wide, open space is created but scarcely inhabited. This is further emphasized in the asymmetrical details of the architectural framework.

In *The School of Athens*, the composition is symmetrical and center focused with figures spread out on an expansive and defined horizontal plane. This is echoed in the architectural framework through use of a central opening leading towards a high dome, pilasters and statues at the sides of the opening, and pilasters along the walls of the opening that lead to the dome. There is a central vanishing point at the horizon line along with a left and right vanishing point. This is emphasized through the clean divisions of the architectural form, the horizontal planes which create the form, and the depth showcased through the progression towards the high dome.



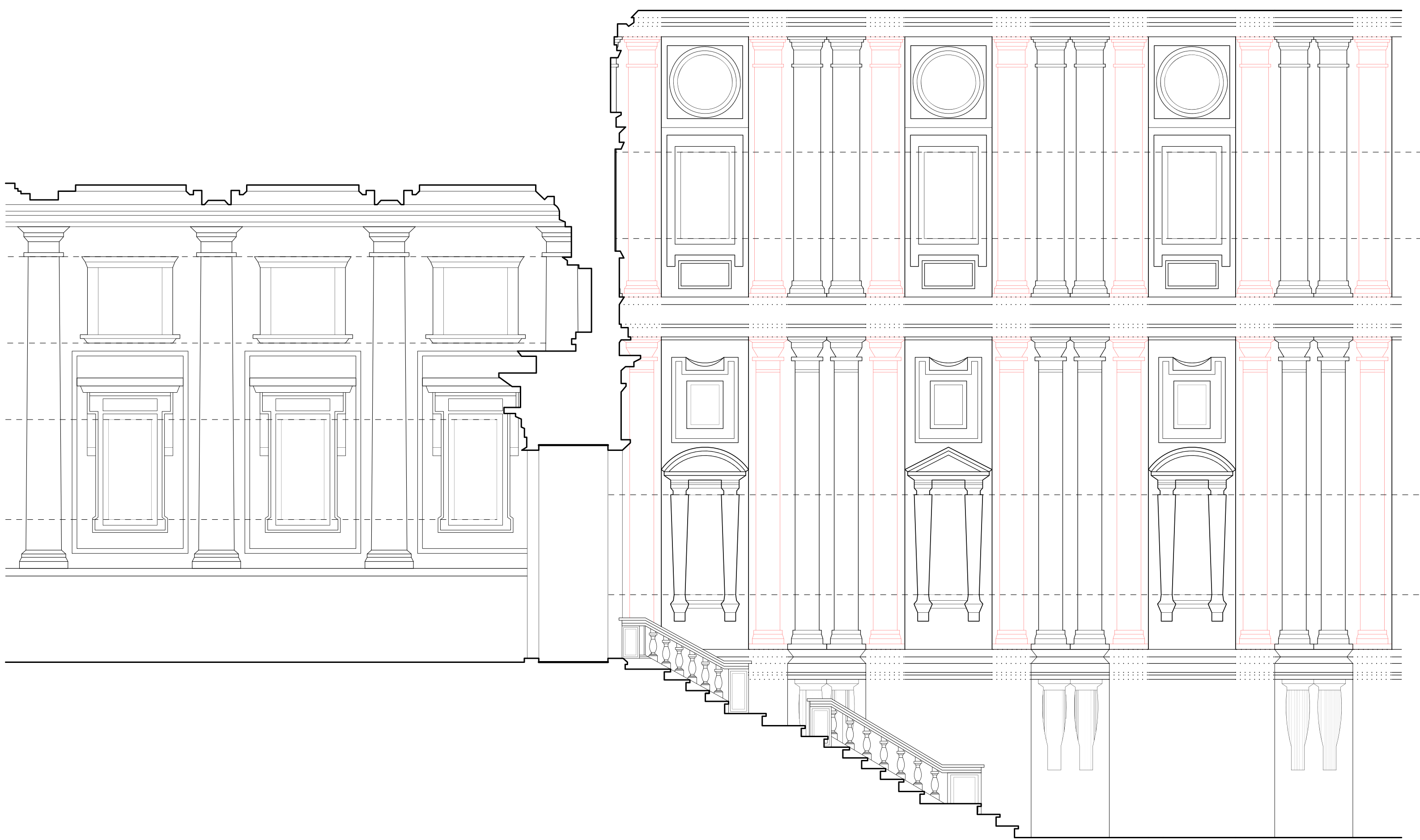
05 Michelangelo Buonarroti

Laurentian Library

Florence, Italy

Point of Interest: Inversion of Proportions

This analysis looks at the inversion of proportions present in the finalized design of Michelangelo’s Laurentian Library in contrast to his initial rendition. The original design intentions, as proposed in Michelangelo’s sketches, arranged/ordered the ricetto’s side walls horizontally which echoed that of the reading room. The intended arrangement of the walls consisted of 4 tucked pilasters in between tabernacles which created horizontal grouping of elements along the wall. This horizontality would have resulted in a seamless relationship between the ricetto and the reading room as well as a cohesive transition between the two rooms. In the finalized ricetto, there is a drastic shift vertically and a departure of the 4-pilaster arrangement showcased in earlier sketches. Instead, in between the tabernacles are 2 columns which face outward and two pilasters which are tucked into the niche as residuals of the compression and inversion of the original design. As a result, the ricetto is subject to constant expansion and contraction of space and exhibits a stark disconnect to the adjacent reading room.



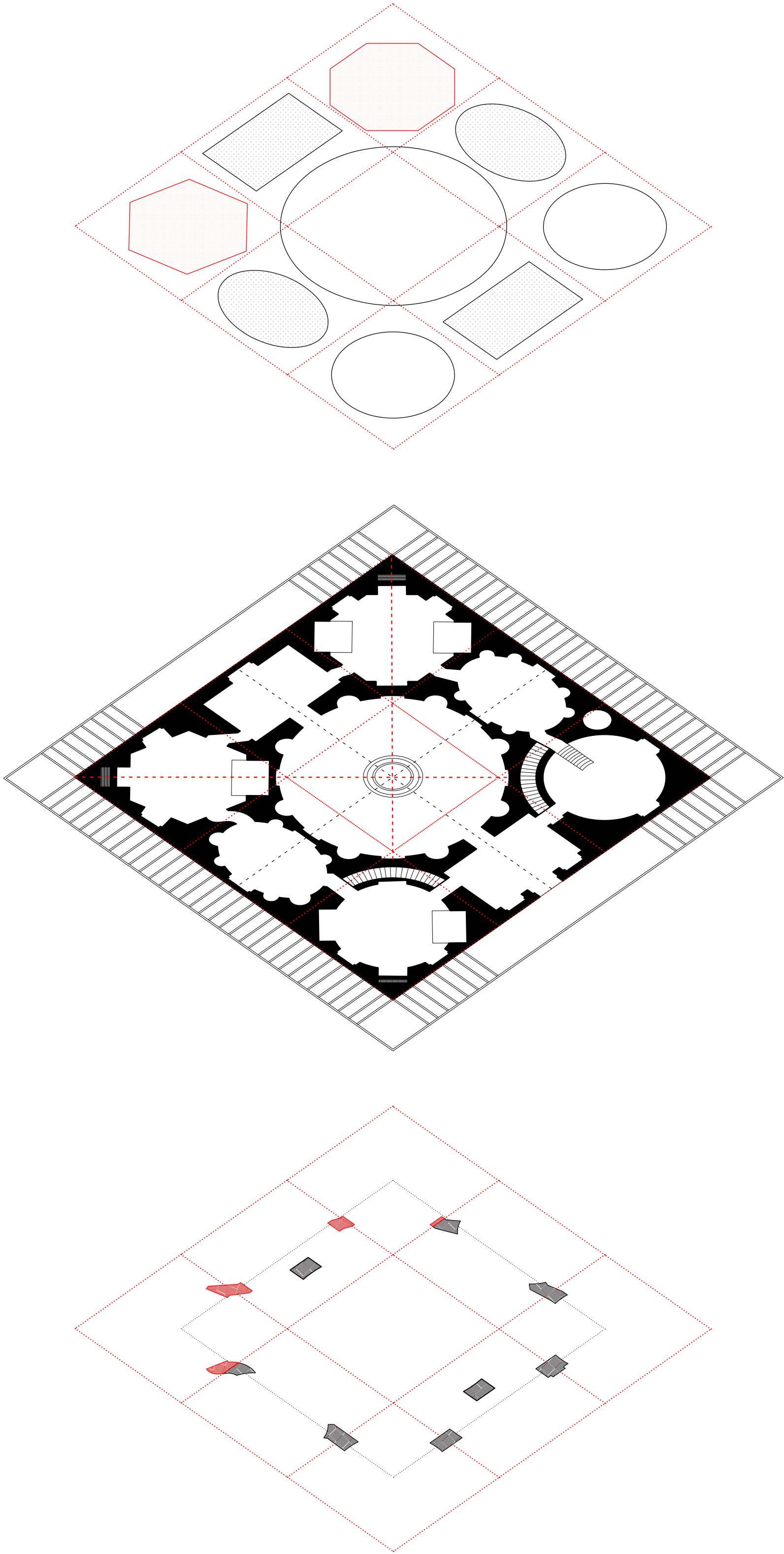
06 Sebastiano Serlio

Pavilion for a King (XXIX) titled *'On the Small Royal House Outside Cities'*

Book VI

Point of Interest: Part-to-Whole Relationship

This analysis looks at Serlio's Pavilion for a King titled *'On the Small Royal House Outside Cities'*. This invention juxtaposes distinct shaped rooms within a thick poche which at first glance seems to be organized axially and perfectly symmetrical but are organized by an underlying nine-square grid rooted by a large circular sala and showcases two distinct forms of symmetry. The nine-square grid not only organizes the different rooms spatially but reinforces the relationships and distinctions these rooms have to one another. Along the main and cross axis of the grid, you have similarly shaped rooms – rectangular and oval, which are perfectly symmetrical with one another along both axes. The pathways connecting these rooms align with one another in an enfilade manner and are aligned through the inscribed square which emerges from the grid. The corners of the grid introduce new connections and differences between the rooms. At the upper corners, the two rooms present have no relation geometrically to each other or the other rooms of the composition, one being hexagonal in shape and the other octagonal in shape and exhibit a diagonal symmetry which is not exhibited by any of the other rooms. Unlike other pathways, those connecting the upper rooms are not aligned to one another or the square inscribed within the grid. At the bottom corners, the rooms have a geometric relationship with one another but exhibit no form of symmetry unlike all the other rooms. Serlio not only utilizes this nine-square grid to form his composition but to create unity/harmony and isolation between the different spaces on a local and global scale. He grounds his composition through nine-square grid and a central circular sala which has a relationship to all the other rooms through its symmetry or geometric shape.



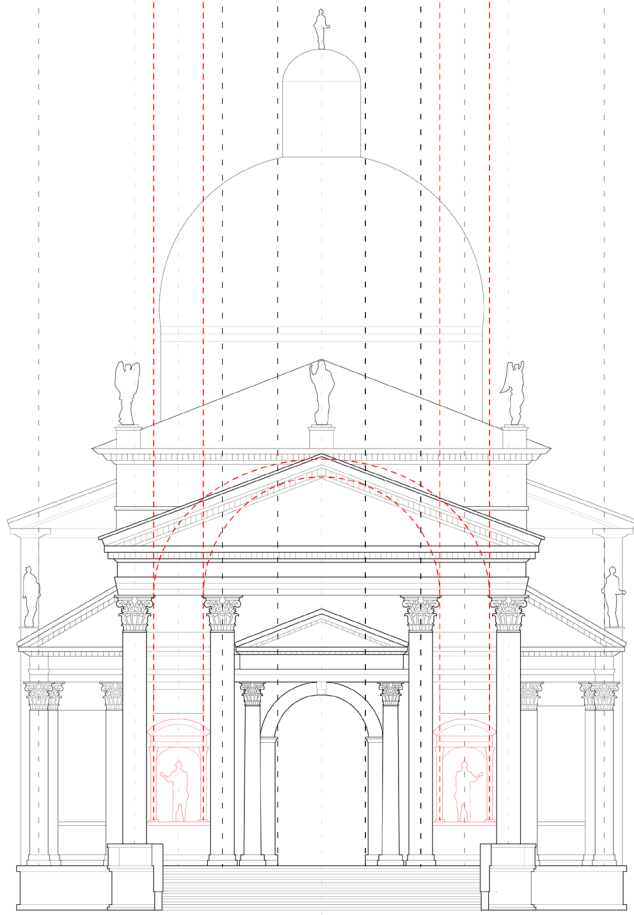
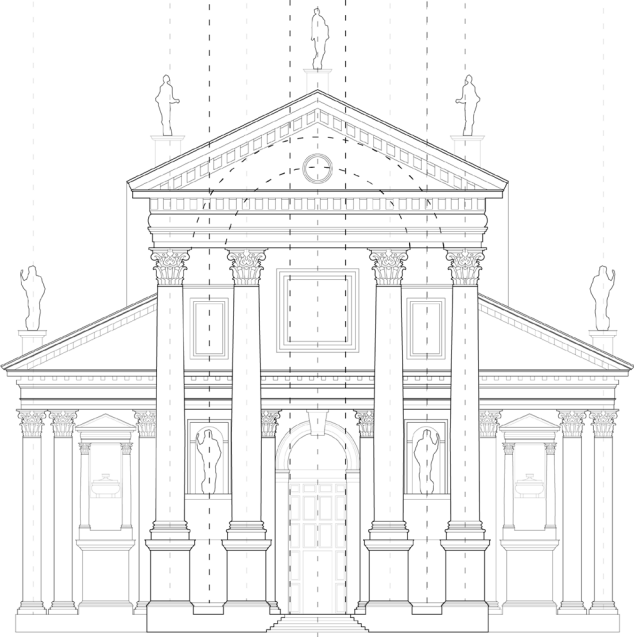
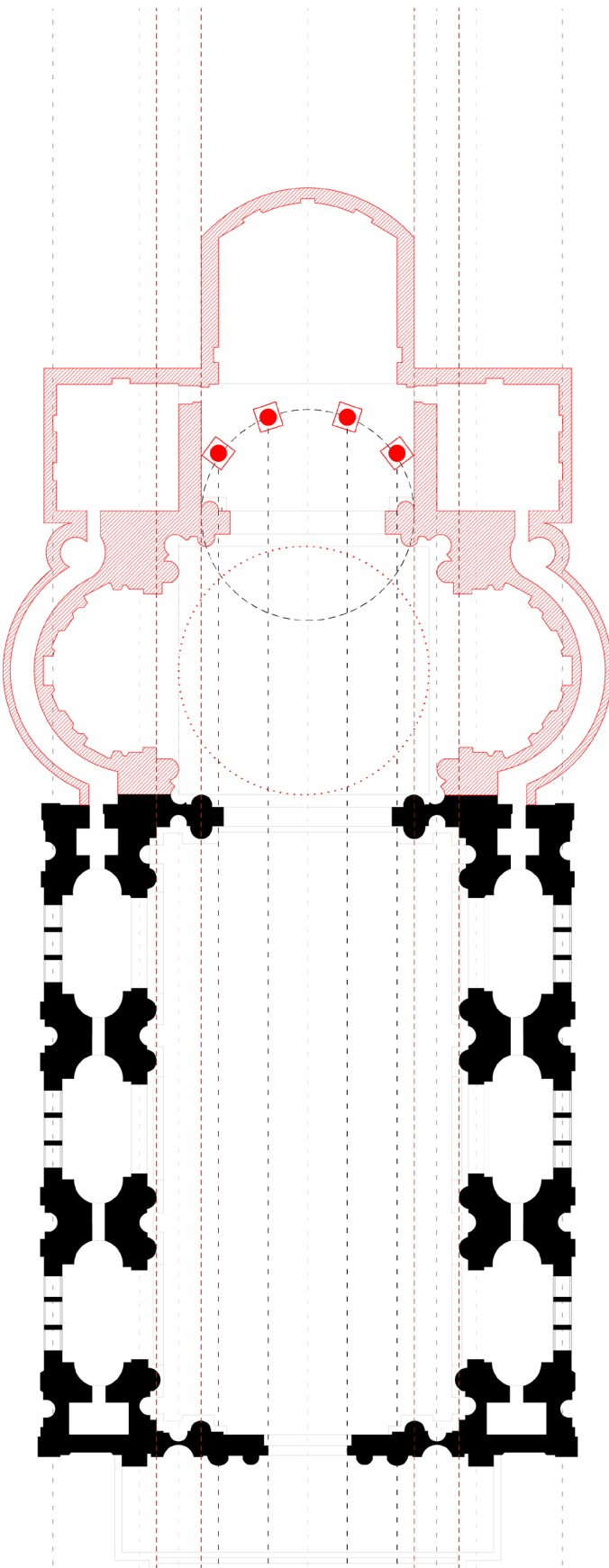
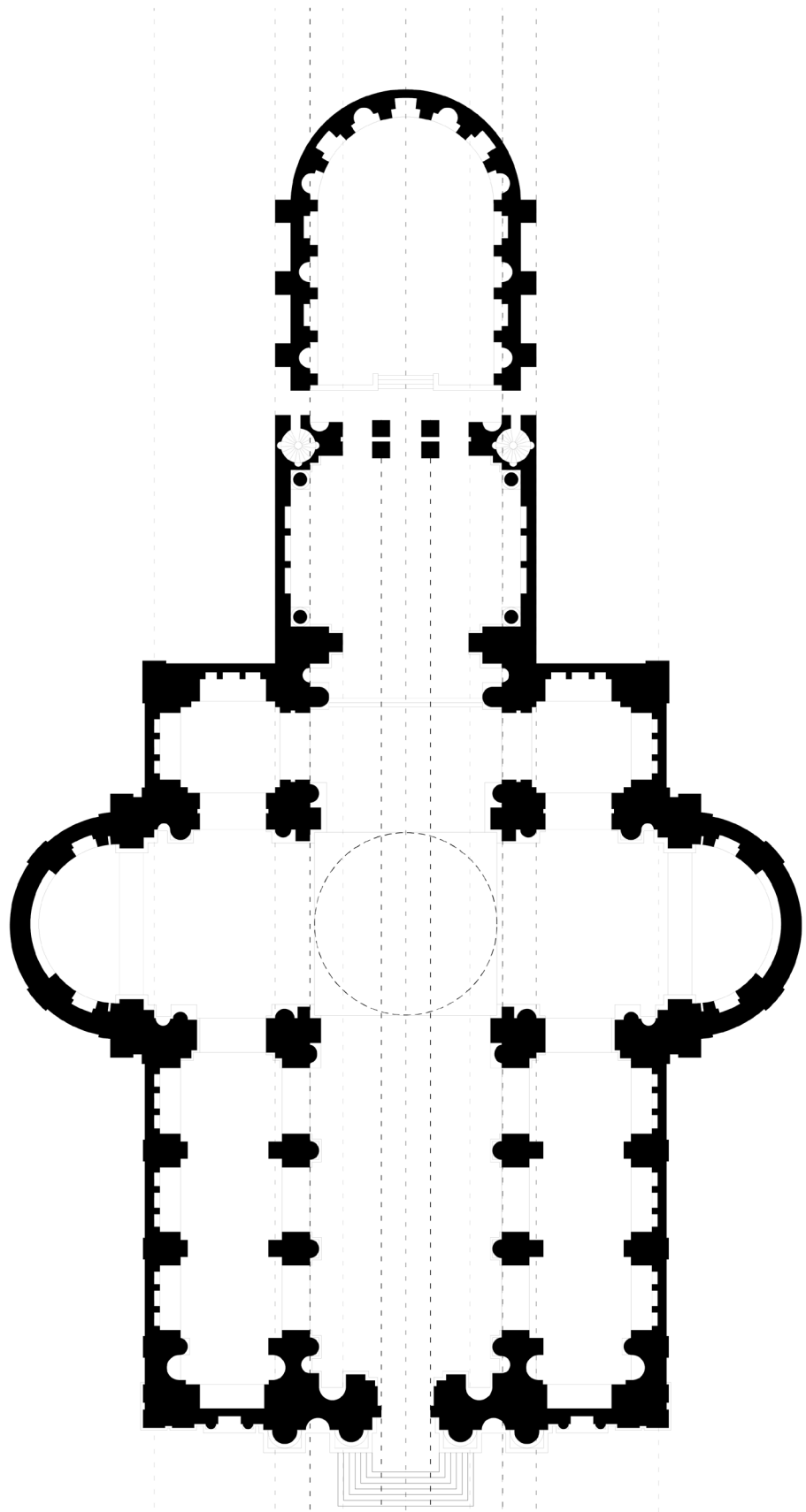
07 Andrea Palladio

San Giorgio Maggiore | Il Redentore

Venice, Italy

Point of Interest: Precedent Proportional Frameworks & Superimposition

My analytical drawings will look at the compositional similarity between San Giorgio Maggiore and Il Redentore which showcase the superimposition of elements of the former onto the latter. The proportions and structural organization of San Giorgio Maggiore, both in plan and façade, serve as the framework for Il Redentore only deviating as a result of accommodating a larger central dome. In San Giorgio Maggiore, there is a strong longitudinal emphasis along the central nave and towards the additive apse. Both of these elements are defined and aligned within the width of the central dome. In Il Redentore, the same longitudinal focus found in San Giorgio Maggiore can be seen. Unlike the former, there is a misalignment of the central nave and central dome whose widths are no longer the same resulting in a gap in the composition. Aligned with the central nave are 4 columns found at the choir which are the residual of placing the proportion of the dome and nave of San Giorgio Maggiore onto the composition of Il Redentore. This is also showcased in the façade; for San Giorgio Maggiore this proportion is expressed between the niches at either side of the entrance and for Il Redentore the niches show the resulting gap of the superimposed proportion.



08 Giacomo Barozzi da Vignola

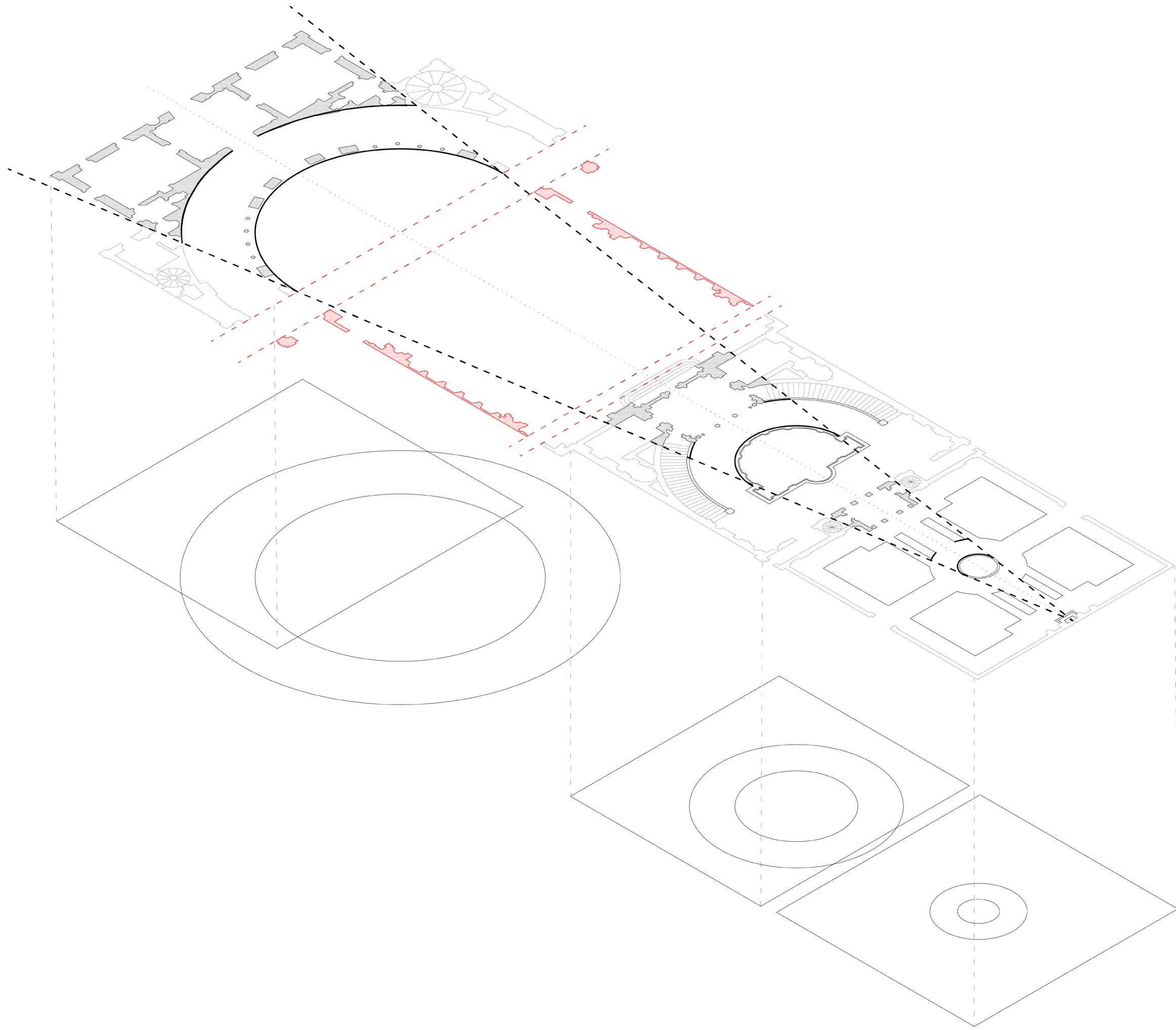
Villa Giulia

Rome, Italy

Point of Interest: Scalar Progression & Proportion of Architectural Frames

This analysis looks at the conical proportional progression of the rectangular, circular, and arched elements that funnel from the casino to the back garden wall of Villa Giulia. Within Villa Giulia, at each entrance section of the building, a tripartite condition, flanked by a rectangular frame, is exhibited. These proportions are inwardly focused and become smaller in scale as they approach the rear. Also exhibited within the Villa Giulia, is a series of circular and arched features that hold the tripartite condition created at each entrance section. As they move from the entrance to the garden, they also become smaller in scale and gradually funnel down to the back wall. These architectural elements create a series of frames which unify the distinct spaces that compose the Villa Giulia and allow more harmony between them.

The drawing highlights the scalar progression of rectangular, circular, and arched elements that funnel, in a conical form, from the casino to the back garden wall of Villa Giulia. Within the architecture, the elements create a series of frames as they scale down which unify the distinct spaces that compose the Villa Giulia and allow more harmony between them. Called out in red is the segment of the villa which does not follow that condition and introduces a horizontal expansion in the space.



09 Francesco Borromini

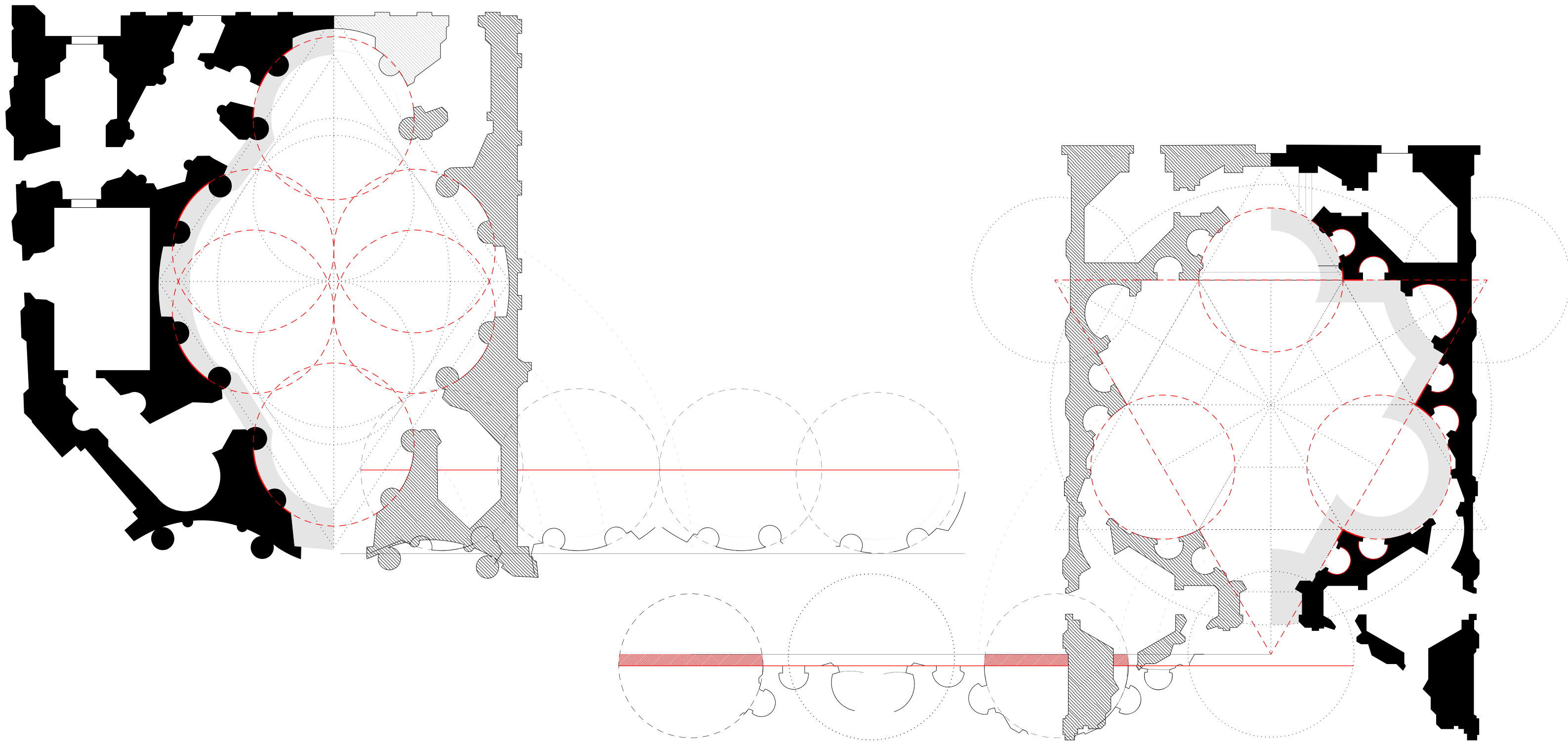
San Carlo alle Quattro Fontane | Sant'Ivo alla Sapienza

Rome, Italy

Point of Interest: Surface (Dis)Continuity

This critical difference analysis looks at the continuity and discontinuity of surface as a result of overlapping or discrete underlying geometrical elements found in in San Carlo alle Quattro Fontane and Sant'Ivo alla Sapienza. In San Carlo, a fusion/interconnection between the compositional geometric shapes of the plan is present. Underlying geometries are no longer recognizable as individual elements but as forms of their fusion. The addition of embedded circular columns further facilitates this fusion and enhances the smooth transition and continuity of surface along the wall. In contrast, within Sant'Ivo the different underlying geometries remain discrete and can be identified by the sharp edges, corners, and jutting forms providing a disjointed reading of surface along the wall. This is accentuated by the corner columns used at these points. As a result, the underlying geometric elements emphasize the interior space created rather than the wall around it.

In San Carlo, the underlying circles and ovals completely surround the space of the church and tangent segments from these shapes are seamlessly defined along the surface of the wall. Unrolling the plan, reveals the alignment of these geometries along a datum line. This echoes the continuity which is present along the wall of the space. In Sant'Ivo the underlying triangular and circular forms define the corner conditions which emerge in the wall. Unrolling the plan, reveals a gap where the datum line aligning these elements would exist and their actual alignment in plan. This parallels the disjointed nature and discontinuity present along the wall and highlights the use of geometric elements to articulate space.



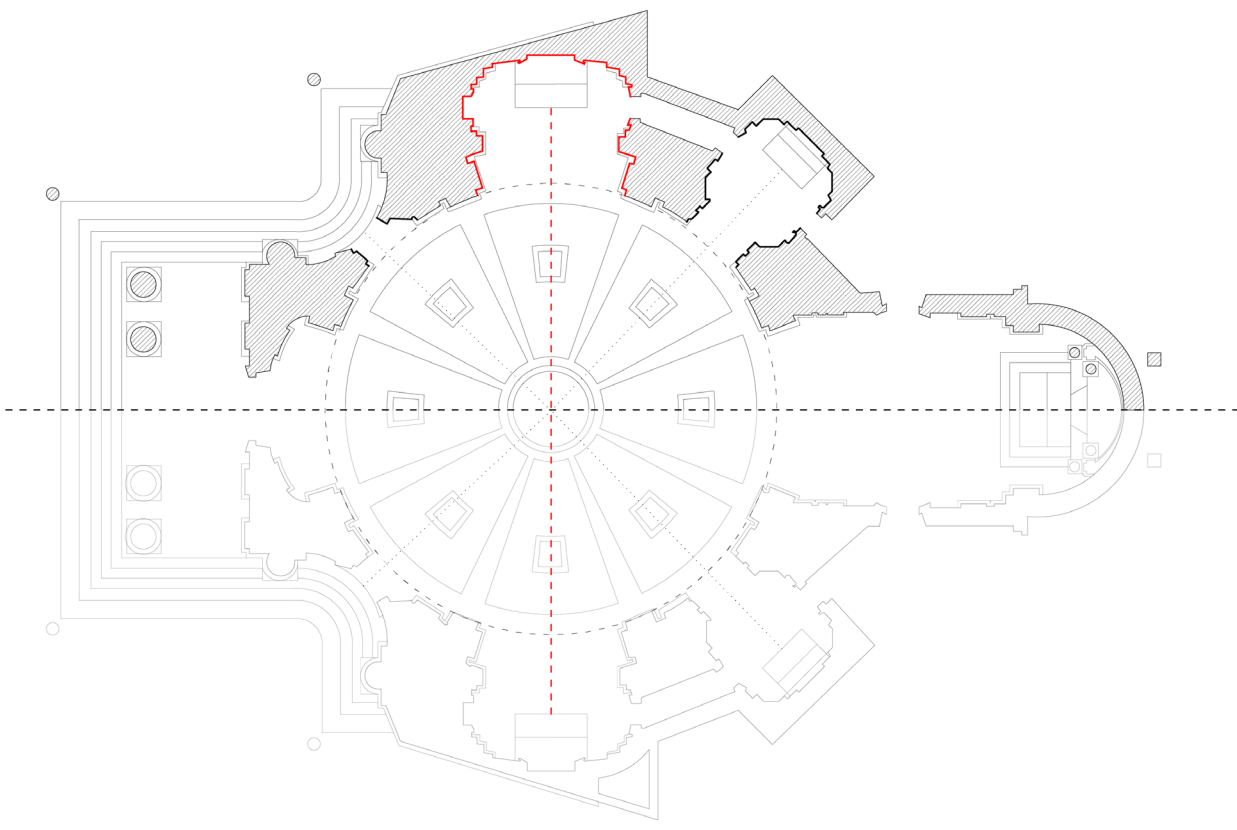
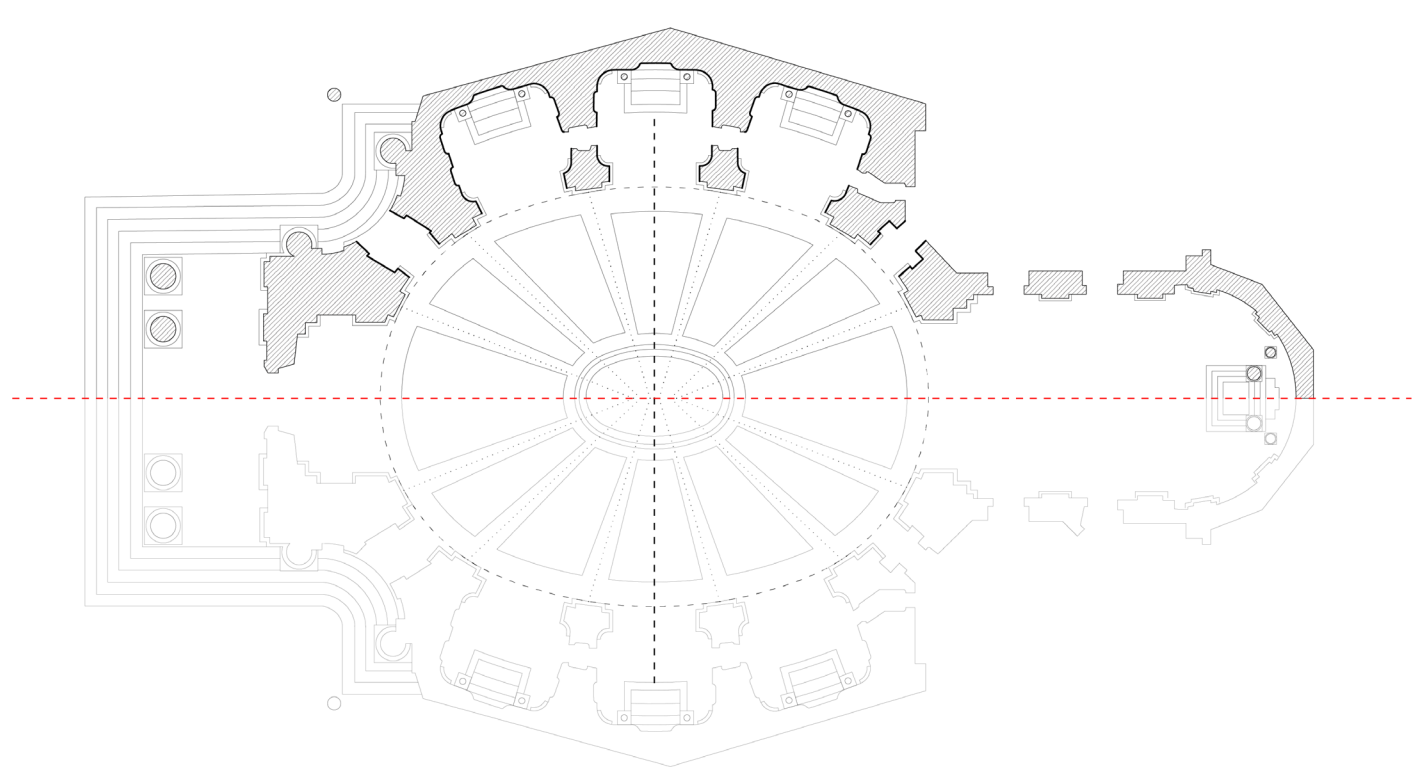
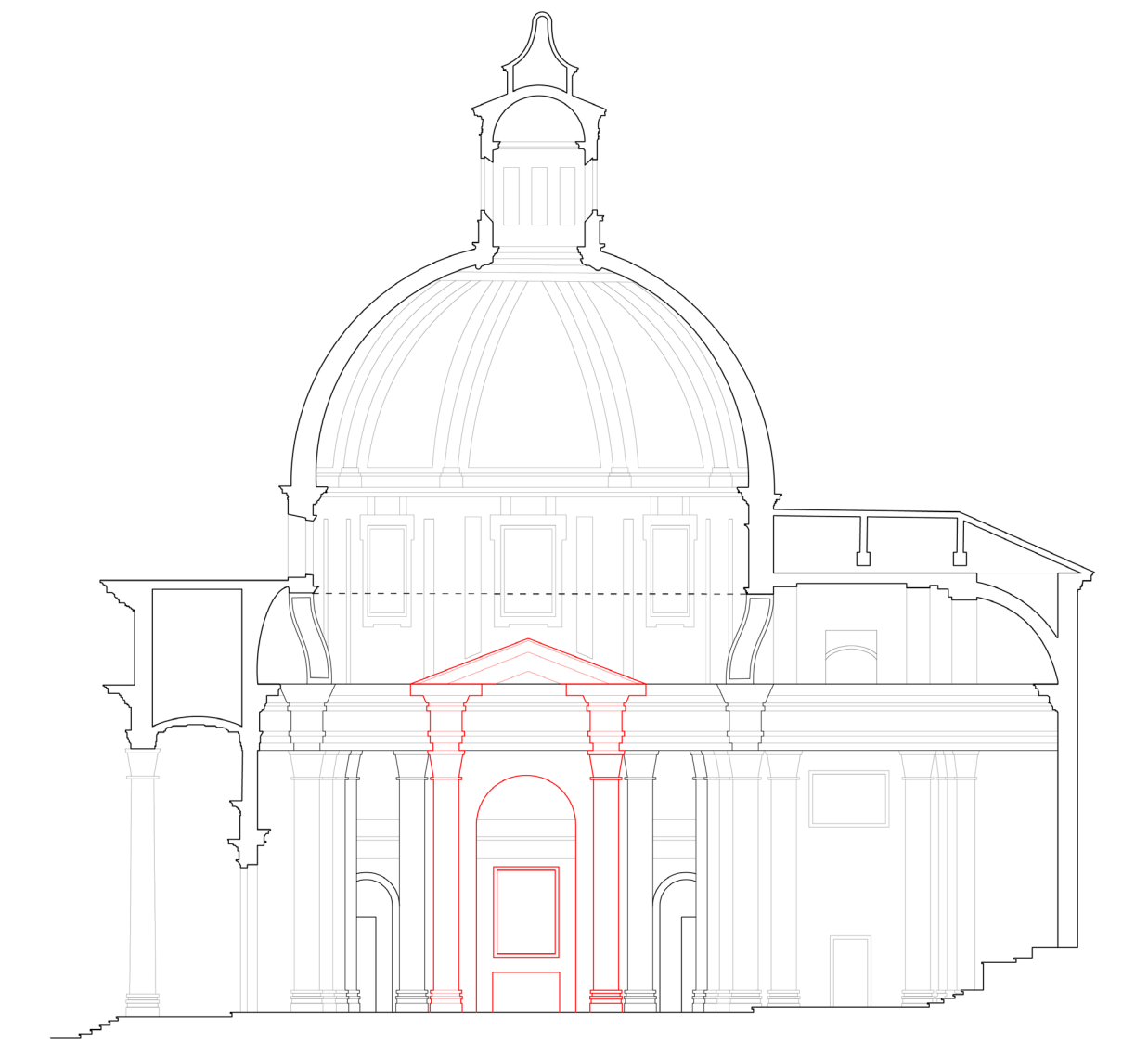
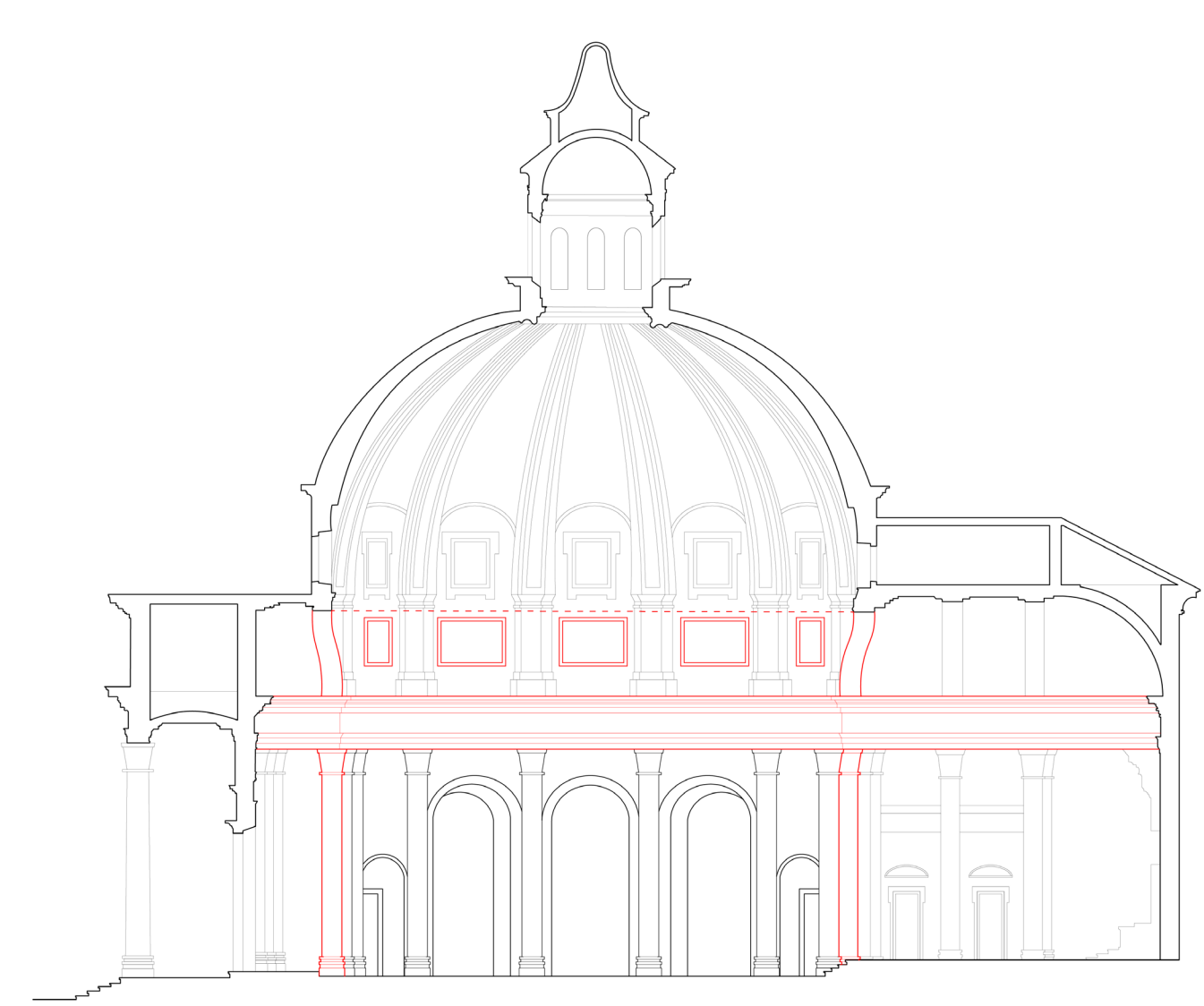
10 Gian Lorenzo Bernini & Girolamo Rainaldi

Santa Maria dei Miracoli | Santa Maria in Montesanto

Rome, Italy

Point of Interest: Axial Relationships

This critical difference analysis looks at the differing axial relationships and corresponding interior configurations found in Santa Maria dei Miracoli and Santa Maria in Montesanto. In Santa Maria in Montesanto an elliptical plan is employed and a prominent longitudinal focus is placed around the interior along the ground plan and vertically along the dome. The spatial configuration is elongated towards the apse and is accentuated by the thick cornice and panels which surrounds the whole church. The cornice is continuous along the space and is not interrupted by the pilasters which it sits on. In Santa Maria in Montesanto, the secondary focus is along the latitudinal. This is reinforced by the pilasters, side chapels, and side entrances which are rendered equally to one another and are left undistinguished. The latitudinal axis is subordinated and obscured by the symmetrical poche which surrounds the side chapels. In contrast, Santa Maria dei Miracoli utilizes a circular ground plan with a prominent latitudinal axis instead of a centralized one. Secondary focuses, radially and along the longitudinal, are placed around the ground plan and vertically along the dome, respectively. Towards the apse the cornice is discontinued and broken by pilasters. These pilasters support an arch that opens towards the apse and creates an axis. In contrast, the cornice around the side chapels is the same emulating the circular nature of the ground plan. The columns of the large side chapels support pediments which are in line with one another and emphasize the latitudinal axis. These chapels are more distinguished and dominate over the side chapels and entrances which are radially placed along the plan. This is further emphasized by the different poche utilized around the large side chapels and the smaller side chapels.



11 Giambattista Nolli & Giovanni Battista Piranesi

Pianta Grande di Roma | Campo Marzio

Rome, Italy

Point of Interest: Figure-ground vs. Figure-Figure Relationships

This critical difference analysis looks at the contrasting relationships between the urban and architectural scale in Nolli's Pianta Grande di Roma, which emphasizes a figure-ground relationship, and Piranesi's Campo Marzio, which emphasizes a figure-figure relationship. Nolli's Pianta Grande di Roma, is a scientific depiction of the existing conditions of Rome. The map juxtaposes organic lines with structured lines to establish distinct figure-ground conditions. There is a clear delineation between architecture, streets/pathways, and the urban space as well as the relationships that exist between them. In Pianta Grande di Roma, most of the architecture is aligned to the river and alleys illustrated through circulatory paths which anchor them to the city. In Nolli's map, the architecture and urban scale are intertwined and are treated as complementary components which are integral to composing the city of Rome; what is built on the ground is just as important as the ground itself. In contrast, in Campo Marzio, Piranesi composes a collection of architecture and architectural elements at different scales and renders their boundaries as walls and columns. These elements are represented consistently regardless of their real scale, function, etc. through the use of similar figures and exist within the same hierarchy as the urban context. Streets are not depicted but rather the leftover space which is carved out of by the elements pushing against one another. The relationships within the architecture and between the architecture rather than exterior conditions and the relationships these elements have to those conditions is in focus. Axial groupings, lines of symmetry, shared axes, etc. are utilized to highlight the figure-figure relationships and suggest that architecture does not merely conform to its urban context.



12 Donato Bramante. Michelangelo, Carlo Maderno

St. Peter's Basilica

Vatican City

Point of Interest: Definition of Form and Elongation of Space

In collaboration with Eric Wang

This analysis looks at the evolution of plan iterations of St. Peter's Basilica in Vatican City over the course of its planning. Remnants of previous precedents are embedded within the various plans and overlapping forms and details build upon each other through each iteration. The architecture is a clear product of many eras and many minds and showcases unity and compromise between ideas. Three architect's plans were utilized for this analysis; Donato Bramante, Michelangelo Buonarroti, and Carlo Maderno, respectively. Firstly, there is a clear evolution from suggested forms towards more explicit forms; spaces and rooms become more defined over time. In Bramante's plan, short walls and columns were utilized to suggest spaces and underlying geometries. This resulted in an ambiguous and segmented spatial progression. In Michelangelo's plan, thick walls and poche are implemented which created defined spaces and district boundaries. Underlying geometries and a Greek cross spatial progression were more defined. This was similarly reflected in Maderno's plan through the use of a Latin cross spatial progression. Secondly, there is an elongation of the floor plan over time. Bramante's plan showcases perfect symmetry and no distinction between front and back. Spaces within are rendered similarly and treated with no hierarchy. In Michelangelo's plan, a longitudinal elongation becomes present and a distinctive segment along this axis emphasized the front portico. Distinction between spaces and segmentation was becoming more present. In Maderno's plan, this elongation is made even more prominent. Within this plan, more distinctive spaces and segments of space can be seen as well as the pulling of the front façade away from the center.

